

FHWA Docket No. FHWA-2001-11130 - 6

DEPT. OF TRANSPORTATION
DOCKET

02 JUN -6 PM 2:38

Work Zone Safety

176071
COMMENTS

May 22, 2002

Ms. Shelley Row
Office of Transportation Operations
HOTO-1
Federal Highway Administration
400 Seventh Street, SW
Washington, DC 20590-0001

Dear Ms. Row:

Thank you for the opportunity to comment on better addressing work zone mobility and safety concerns. I appreciate your long-standing interest in the topic. I enjoyed meeting you at the ITS World Congress held in November of 2000, and I appreciated your interest on my presentation pertaining to the use of ITS in work zones.

Please consider my comments below a summary. I would gladly assist in researching topics related to work zone safety and improved work zone mobility. My experience includes a view from the "owner" side (with Illinois Department of Transportation) and a view from the consultant side.

The "Statement of the Problem" in the Federal Register is indeed correct about the magnitude of the cost of congestion. The projected user costs for one project on which I recently worked, including time and fuel, exceeded \$110 million or approximately ninety percent of the \$123 million construction cost. The increase in probability for accidents was not included in the user cost analysis because statistics on accidents in the work zones were not readily available.

The "Statement of the Problem" also precisely identifies the fundamental need: to include the mobility and safety impacts of work zones in the project development process. This would include looking at the full life of the transportation infrastructure.

Technology exists to address many of the key findings cited in the Federal Register. Implementing the technologies, however, is not easily done for three primary reasons:

- Few agencies legitimately include user costs, both for the present construction and future rehabilitation and reconstruction, in their decision making process.
- The culture of many agencies in light of severely constrained funding is to place the funding in concrete, steel, and asphalt, not congestion-reducing and life-saving technologies.
- There is continued political pressure to resurface or rebuild more miles of highways and very little pressure to invest in durable, long-life pavements.

The Federal Highway Administration is in the position to require the user cost analysis for all projects using Federal funds. Through education, the culture of agencies can also be changed.

If user costs were taken into account in the selection of maintenance of traffic schemes and the selection of rehabilitation/reconstruction strategy, the following would occur:

- More durable pavement and bridge designs and materials would be used. European pavement tends to outlast U.S. pavements not because we have inferior materials or abilities, but because pavement life in Europe is designed taking the congestion caused by construction into account.
- Repairs would be made, when possible, in off-peak hours.
- Incentives would be used to reduce construction or repair time.
- Better signage and ITS technology would be used to re-route traffic to avoid the roadwork.
- Bridges would be designed with adequate shoulders to allow more lanes of traffic to be open across the bridge during construction.
- Incident Management Plans would be in place with tow vehicles standing by in peak hours to clear crashes and breakdowns.
- Advanced Traveler Information Programs would be more extensively used to promote avoidance of the work zone entirely, or to encourage mode shift during the construction.

As a result of these improvements, crash rates and fatalities within work zones would decrease.

Some of the technologies I have seen as effective, usually when accompanied by enforcement, include:

- The "Indiana No Passing Zone" approaching work zones with a reduced number of lanes. Numerous accidents are caused by vehicles speeding through the clear (but closed ahead) lane to get to the front of the queue. By preventing drivers from passing, a more courteous merge takes place with lower speeds (and lower differences in speeds between lanes).
- Variable Message Boards with messages that are queue sensitive. As congestion grows, the messages upstream from the work zone change automatically in order to allow drivers to avoid the congestion.
- Queue prediction (rather than just reporting) allows measures to be taken prior to the queue even forming. For instance, when heavy volumes of traffic are detected approaching a work zone, variable message boards can suggest alternative routes and variable speed limits can assist in dispersing the peak heading toward the work zone constraint.
- Ramp metering.

Advanced public information campaigns have also been very effective. These promote finding alternative routes before the project starts, use of alternative modes, and spreading out the peak. Spreading out the peak can also be coordinated with employers who can officially shift work hours or allow flextime.

Some low-technology measures can be effective and can be implemented at very minimal cost. For instance, in freeway work zones, the restriction of slow-moving vehicles can increase mobility. For urban projects, simply preventing the contractor from stockpiling reinforcement steel or placing metal barricades over traffic signal detection loops can greatly decrease delays. (The steel or barricades are detected by the loops as though a vehicle is present, so the signal gives a maximum phase to a lane that is closed, minimizing green time for the open lanes.)

Even though many of these technologies are relatively low cost – perhaps 10% or less of the construction cost, they do not get used on projects because user cost analysis is not required and because, under severely constrained budgets, the pressure is to maximize the miles or number of projects completed, not minimize the user cost.

In summary, I believe the FHWA can be effective in improving mobility in work zones and decreasing work zone fatalities by:

- Requiring a legitimate user cost analysis for the selection of alternatives.
- Providing statistics and methodology to fairly compare alternatives (including accident statistics, accident costs, the value of occupant time, the cost of fuel and maintenance, and the cost of emissions).
- Provide education and guidance to state and local agencies in applying user cost analysis, ITS technologies, and other work zone safety approaches.
- Assist in the passage of legislation that allows enforcement of variable speed limits and variable no-passing zones.
- Refinement of traffic simulation models to more accurately take into account lane merges at work zones and the affects of aggressive drivers.

I believe the fundamental question is whether Americans are ready to accept the trade off: More spent on saving time and lives, or more roadways reconstructed now. In the long term, more durable roads, more time saved, and more lives saved is the lowest cost solution.

Thank you for your solicitation of comments and your time in reviewing comments received. I have attached my comments grouped in the categories listed in the request for comments.

Sincerely,



Thomas W. Williams, PE
Vice President
V3 Infrastructure Services, Ltd.
3097 Prairie Street, SW
Grandville, Michigan 49418

V3 - Visio, Vertere, Virtute, meaning...
"The vision to transform with excellence"

Attachment (3 pages)

General

1. Yes, a National policy should be implemented. The policy may have regulations (concerning the analysis of user costs that must occur) and also give guidance (concerning best practices, etc.)
2. No, the current provisions of 23 CFR 630, Subpart J are not adequate. The current provisions require a traffic control plan, but do not have provisions for ensuring this is the best plan based on the impacts of mobility and safety. The policy should include requiring analysis of alternative maintenance of traffic schemes and analysis including the entire influence area for the proposed work.
3. Yes, regulations could be stratified. The most appropriate factors would include duration, expected capacity reduction, and potential impacts on local network and businesses. However, relatively quick user cost analysis could determine, for any project, whether more detailed analysis should be conducted.
4. I do not believe the time spent in arriving at a common National definition is well spent nor is it essential to increasing mobility and safety in work zones.

Transportation Planning and Programming

5. I know of very little consideration of impacts to road users addressed in transportation plan and program development. In one state, there is consideration given to programming potential alternative routes in different years (so that the alternative route is not also under construction). In most states, not until well into the plan development process is the maintenance of traffic considered. At this point, adding the cost of any ITS (or other features that would save user costs) just contributes to "scope creep" and is frowned upon within state agencies.
6. Metropolitan and statewide planning processes definitely should include to life-cycle costs (that is, including life-cycle of infrastructure plus costs to user) even when the project costs may increase. Even through up-front project costs increase, the overall costs will decrease. Currently, to many costs are pushed off to roadway users, businesses, and future taxpayers.
7. Most agencies use some sort of project "scoping" in order to program projects. Rarely is more than a lump sum added for maintenance of traffic. I believe the data and methodology are currently available or easily developed to also include user costs in the "scoping" process. Including the correct and complete costs of projects will create a fundamental problem: the number of projects programmed will decrease.

Project Design for Construction and Maintenance

8. I believe requiring the complete life-cycle costs analysis (including user costs) in order to approve a project in the planning stage would encourage agencies. Hand-in-hand with the requirement, education on the process and guidance on methodologies and statistics will be needed.

9. Yes, user costs are a useful measure to assess alternatives. User cost analysis should be nothing more than translating added travel time, added fuel use, added potential for crashes, and other factors into economic terms. For virtually all projects, the two highest factors are time and accident costs. The three easiest to translate into economic terms are time, fuel consumption, and accident costs. Time and fuel are direct outputs of most microsimulation models, so no additional analysis needs to be performed. Accident costs are readily available, although FHWA would need to provide guidance as to the increased probability of accidents due to different degrees of congestion in work zones. Guidance will also need to be given on the cost of time since there is great disagreement in the industry as to the appropriate hourly rate for users.
10. The impact of utility relocations on projects is a complex topic, not easily summarized in a comment. Utility relocations have ramifications that have caused environmental impacts and right-of-way impacts for many years. One method used in recent years on a few of my projects is advanced utility relocation packages. In these construction packages, utilities are relocated to their new, non-interfering locations the season prior to the construction. I realize, however, that this is not always possible or practical. Utility contractors should be under the same Work Zone Safety rules as the roadway contractor when on the highway right of way. These same rules should include coordination of activities and maintenance of traffic control devices.

Managing for Mobility and Safety in and Around Work Zones

11. Yes, the scope of TCPs should be expanded. One of the most cost effective methods of matching the technology available to the work zone situation is to use a computer-based decision tree such as being developed by former Indiana DOT employee, Dan Shamo. [E-mail: dan_shamo@urscorp.com] With the use of this decision tree, the recommended work zone elements can be determined in less than a single day's time without having to know all the details of the National ITS architecture.
12. I believe the security aspects, when applicable to a project of national importance, should be addressed in a separate plan, not the traffic control plan. The TCP, by implied definition, is to plan for efficient traffic movement. A separate rule should be developed regarding security.
13. ADA requirements should be addressed where applicable due to current pedestrian activity in the vicinity of the project. Few freeway projects would need to address ADA requirements.
14. No response.
15. Audits would be useful in holding personnel at different project implementation stages accountable. For instance, the commitment may have been made in the planning stages to include ITS features to communicate lane closures to the public, but this may have been eliminated in the design stage to save money. Variable message boards may have been included in design, but the Resident Engineer allowed the boards to be eliminated as part of a trade off for an increase in quantities related to extending the paving up the ramps.

Public Outreach and Communications

16. The responsibility for informing the public should fall on the agency with jurisdiction over the highway under construction. This generally would be the local agency for a local project, and the State Region or District Engineer for state projects.

Communication should take multiple forms:

- Communication in advance with business owners and government officials to suggest measures to “spread out the peak” in traffic volumes.
 - Communication in advance with the public to suggest drivers find alternative routes prior to the start of the project.
 - Communication to occasional travelers through brochures and signs at Welcome Centers (Rest Areas).
 - Communication to daily travelers through project web sites, kiosks, and the media. (Note that traffic is news, and television and radio compete to provide the best service. There is seldom a need to pay additional for this service. In fact, television stations may enter into public/private partnerships allowing some of the CCTC cameras to be paid for privately.)
 - Communication to those on the road through accurate variable message signs. Current information is critical, implying the need for queue detectors, CCTV, and/or a traffic management center.
17. Yes, projects with substantial disruption should include a public communication plan in the project development process. This plan should contain the results of an analysis of desired communication architecture, lines of communication, an incident management plan, and a summary of potential funding for the public communication. The plan should outline what elements are included in the contract documents (such as portable variable message boards) and what elements are outside the contractor’s responsibility (such as informational brochures). Based on the plan, communication tasks may be implemented prior to construction even beginning.

Analyzing Work Zone Performance

18. No response.
19. No response.
20. No response.

Other

21. Technology exists and will continue to be developed that will help in increasing mobility and safety in work zones. The FHWA is making great strides toward a policy that will assist in implementation and education. The “third prong” that needs to be addressed is legislative. Technologies already exist that have outpaced the legality of enforcement. (The use of red light violation cameras provides an example of where legislation is only slowly catching up to technology.) The FHWA should also provide guidance for development of legislation as was done with the “Stop Red Light Running” campaign.